Abstract

PUBLICATIONS

Novel algorithm for automatic contour detection in image sequences

Wang, He, Zhuang, Tiange, Jiang, Dazong, Shanghai Jiaotong Univ.; Bacelar, A., Liu, Wan-Yu, Magnin, Isabelle E., Gimenez, Gerard, INSA

Publication: Proc. SPIE Vol. 3024, p. 237-245, Visual Communications and Image Processing '97, Jan Biemond; Edward J. Delp; Eds.

Publication Date: 1/1997

Abstract:
Sequential images are getting more and more popular in reconstruction of 3D images for computer-aided surgery or radio-therapy, where contour detection is needed and plays a significant role. In order to overcome the conflict of optimization with computational cost, we have recently developed a novel algorithm to track contours in an image sequence automatically. The whole procedure starts from a list of labeled seed points on/near the desired boundary in the first frame, and extracts the first contour by dynamic programming (DP). Such contour is thickened symmetrically to form a band area, which is assumed to cover the desired contour in the second frame. Meanwhile, the previous seed points are regarded as uncertainties of the second frame. Then a new method is proposed to optimize these points within the band, that is, DP is operated again between two uncertainties which are t(t > 1) points apart, and get an optimal path. Such path may depart from the true contour near the two end-points, but possesses the optimal choices for the interval uncertainties. After all the uncertainties are optimized, the second optimal contour can be tracked, and again participate in the tracking of the next frame until all the contours in the sequence are outlined. Experiments shows optimal and intersection free result in sequences of cardiac vessels.

Abstract

PUBLICATIONS

Motion-compensated signal and background estimation from coronary angiograms

Close, Robert A., Whiting, James S., Cedars-Sinai Medical Ctr.

Publication: Proc. SPIE Vol. 2434, p. 185-194, Medical Imaging 1995: Image Processing, Murray H. Loew; Ed.

Publication Date: 5/1995

Abstract:
Conventional vessel tracking and segmentation techniques identify the positions and two- dimensional structure of arteries in each frame of the angiographic sequence, but cannot distinguish the artery and background contributions to the intensity. We report a new technique for motion-compensated estimation of artery and background structures in coronary angiograms. The image within a region of interest is modeled as consisting of a sum of two independently moving layers, one of which contains the artery and one consisting of only background structures. The density of each of these layers is solved under two assumptions: (1) within each layer, the density varies from frame to frame only by rigid translation, and (2) the sum of the densities of the two layers equals the actual image density. This technique can be used to enhance image sequences by subtracting the component of the background whose temporal variation is entirely due to rigid translation. The feasibility of this technique is demonstrated on synthetic and clinical image sequences.

grid of Potential Points by inverting artery & background Image

L Number	Hits	Search Text	DB	Time stamp
1	97	(((edge$4 or boundr$4 or curv$4 or path$3) near4 (track$4 or detect$4 or locat$4 or follow$4 or sens$4 or measur$5 or read$3)) same (x$ray or vessel$3 or medical$3 or biomedical$3)) same (kernal or matri$4)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/21 13:31
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-	1545	((edge$4 or boundr$4 or curv$4) near4 (detect$4 or follow$4 or sens$4 or measur$5 or read$3)) same (vessel$3 or $3medical$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/18 15:24
-	15	(((edge$4 or boundr$4 or curv$4) near4 (detect$4 or follow$4 or sens$4 or measur$5 or read$3)) same (vessel$3 or $3medical$3)) same ((start$3 or end$3) near3 (point$3))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/18 16:22
-	521878	(edge$4 or boundr$4 or curv$4 or path$3) near4 (track$4 or detect$4 or locat$4 or follow$4 or sens$4 or measur$5 or read$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/18 15:33
-	8590	((edge$4 or boundr$4 or curv$4 or path$3) near4 (track$4 or detect$4 or locat$4 or follow$4 or sens$4 or measur$5 or read$3)) same (x$ray or vessel$3 or medical$3 or biomedical$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/18 16:16

-	10	(((edge$4 or boundr$4 or curv$4 or path$3) near4 (track$4 or detect$4 or locat$4 or follow$4 or sens$4 or measur$5 or read$3)) same (x$ray or vessel$3 or medical$3 or biomedical$3)) same ((start$3 and end$3) with (point$3))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/21 10:06
-	13	(((edge$4 or boundr$4 or curv$4 or path$3) near4 (track$4 or detect$4 or locat$4 or follow$4 or sens$4 or measur$5 or read$3)) same (x$ray or vessel$3 or medical$3 or biomedical$3)) same ((grid$4 or grat$4 or mesh$4) with (point$3))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/18 16:34

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15	229	382/226.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/21 15:16
22	974	382/197.ccls. or 382/202.ccls. or 382/226.ccls.	USPAT; US-PGPUB; EPO; JPO; IBM_TDB	2003/04/21 15:16
28	142	(382/197.ccls. or 382/202.ccls. or 382/226.ccls.) and ((path$4 or edge$3 or curv$4 or boundr$4) near4 (detect$4 or follow$4 or track$4 or extract$4))	USPAT; US-PGPUB; EPO; JPO; IBM_TDB	2003/04/21 16:02
34	73	((imag$4) same ((extract$4 or obtain$3 or retriv$4 or sens$3) near4 (point$2 or pattern$3))) same ((edge$4 or boundr$4 or curv$4 or path$3) near4 (track$4 or detect$4 or locat$4 or follow$4 or sens$4 or measur$5 or read$3)) same (bidirection$3 or (back near track$4) or (back))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/21 15:37
41	51	((382/197.ccls. or 382/202.ccls. or 382/226.ccls.) and ((path$4 or edge$3 or curv$4 or boundr$4) near4 (detect$4 or follow$4 or track$4 or extract$4))) and (bidirection$3 or (back near track$4) or (back))	USPAT; US-PGPUB; EPO; JPO; IBM_TDB	2003/04/21 16:03